Trend Study 8B-6-00

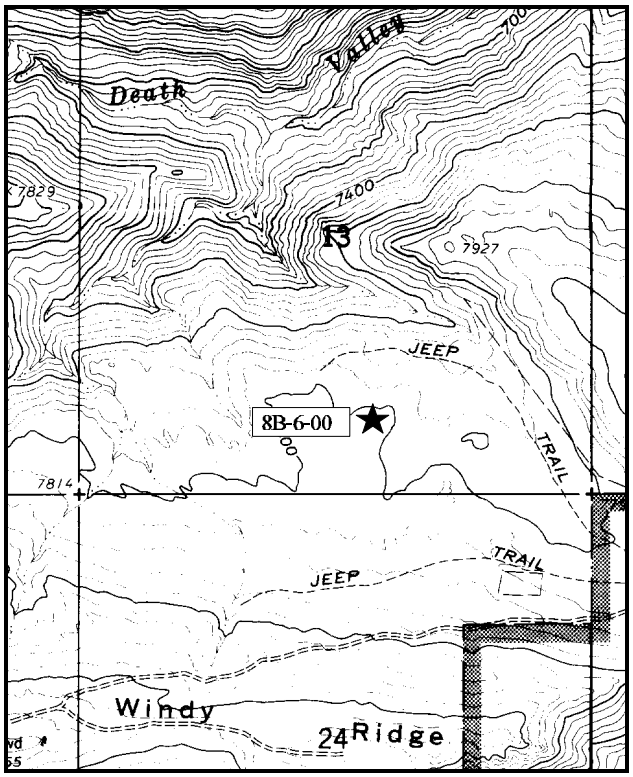
Study site name: Death Valley . Range type: Mixed Mountain Brush .

Compass bearing: frequency baseline 15°M .

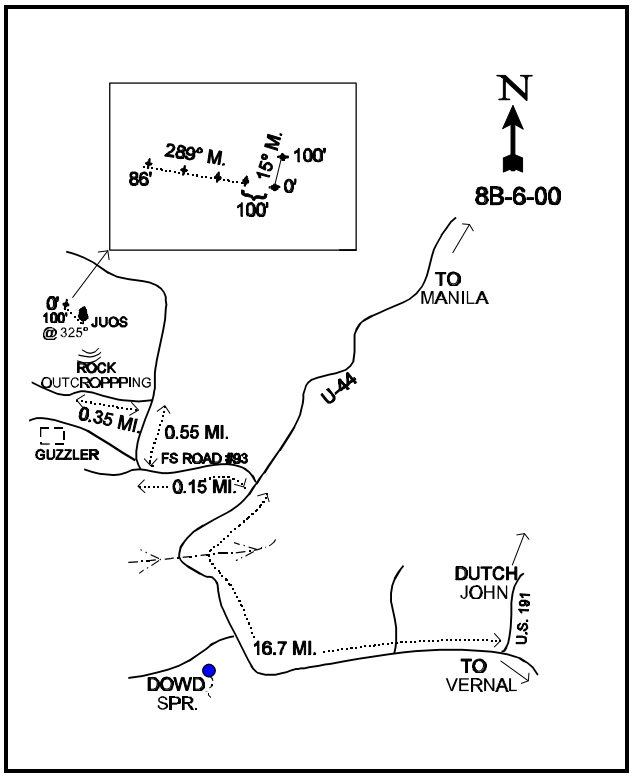
First frame placement on frequency belts 5 Feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the Dutch John turnoff on Highway U-44, proceed 16.7 miles towards Manila. As you reach the summit before dropping down into Sheep Creek, there will be a dirt road to the left. Turn left on FS road #93 and drive west for 0.75 miles until you pass a grove of ponderosa pines. Turn to the right. The road forks again almost immediately, keep to the right and proceed 0.55 miles to another faint fork. Turn left and drive west 0.35 miles to the top of a small knoll. To the north, two rock out croppings mark the highest point of the knoll. From the juniper on top, the 0-foot baseline stake is 100 feet away at a bearing of 325 °M.



Map Name: Manila



Diagrammatic Sketch

Township 2N , Range l9E , Section 13

UTM 4528499.648 N, 606945.431 E

DISCUSSION

Trend Study No. 8B-6 (9-6)

This trend study is located on critical deer and elk winter range in Death Valley. It samples a sagebrush-mixed mountain brush range type at an elevation of 7,800 feet. Death Valley is a broad bench that drops off very rapidly towards Death Valley Creek to the north. The site slope is gentle (3%-5%) with a slight west aspect. Deer and elk use the area heavily in the winter. Pellet group data from 2000 estimate 58 deer and 48 elk use days/acre (143 ddu/ha and 119 edu/ha). Most of the pellet groups encountered appeared to be from winter use. A few cow pats from last season were encountered along with one moose pellet group.

Soils are sandy and shallow with some rock outcrops in the area. Effective rooting depth is estimated at nearly 10 inches. Soil texture is a loamy sand with a neutral pH. Phosphorus is limited at only 2.5 ppm. Values less than 10 ppm can limit normal plant growth and development. Erosion is not a problem due to the lack of slope, abundant well dispersed vegetation, and litter cover.

The most important aspect of this site is the browse composition. Eleven species of shrubs were identified during the 1995 reading and 12 in 2000. The key species are true mountain mahogany and mountain big sagebrush. Mahogany provided 59% of the total browse cover in 1995 and 55% in 2000. Mountain big sagebrush accounted for 20% of the total browse cover in 1995, increasing to 31% in 2000. Mahogany density declined from 933 plants/acre in 1982 to 533 by 1988. No decadent plants were encountered either year and vigor was good. Shrubs displaying heavy use increased from zero in 1982 to 13% in 1988. With the new, larger sample used in 1995, estimated mahogany density was 1,680 plants/acre. Vigor was generally good and percent decadence was low at 2%, even though heavy use had increased to 35%. Density is currently (‘00) estimated at 1,060 plants/acre. Use is moderate to heavy and percent decadence has increased to 23%. Half of the decadent plants sampled (120 plants/acre) were classified as dying. At this time there are no dead plants in the population. Currently (‘00), reproduction in the form of seedling and young plants is poor.

Mountain big sagebrush has a fairly stable population of about 2,200 plants/acre. Most plants have been classified with light use in 1988, 1995, and 2000. The majority of the time (3 of the 4 sampling periods), more of the utilization has been classified as moderate rather than heavy. The exception was in 1995. Vigor has been normal on most plants over the years, although percent decadence was moderately high in 1982 and 1988 before a decline in 1995, down to 18%. Currently (‘00) percent decadence is 37% with poor vigor displayed by 19% of the population. In addition, 46% of the decadent plants sampled were classified as dying (380 plants/acre). No seedlings have been encountered on the site since 1988. The average number of young plants for each sampling period is almost 17%, while the average percent of the population that is dead is 17%. These data would indicate that this population is just barely maintaining their numbers. If drought conditions continue, this population would probably decline in numbers. However, a return to normal precipitation patterns could reverse this trend.

Other important browse include a few large serviceberry, black sagebrush, and antelope bitterbrush. Some fringed sage, rabbitbrush, Oregon grape, snowberry and gray horsebrush were also sampled in low numbers.

The herbaceous understory is abundant and diverse. Grasses are dominated by alpine fescue and Sandberg bluegrass which combined to produce 67% of the grass cover in 1995, increasing to 84% in 2000. Thickspike wheatgrass is also fairly common. Forbs are very diverse, but only a few species produce more than 1% cover.

1982 APPARENT TREND ASSESSMENT

This is one of the better winter range sites on the unit. Overall range condition appears good and trend appears

stable. From a trend monitoring point of view, one of the more important items will be to keep track of the key species, especially reproduction. The field observers saw few established seedlings or young plants but also no decadent plants. A fairly large number of seedlings-of-the-year were observed but were not sampled.

1988 TREND ASSESSMENT

Trend for soil is up. Increases in the measured percentages of vegetative and cryptogamic ground cover led to a significant decrease in the amount of bare soil. Percent bare ground has decreased from 29% in 1982 to 14% in 1988. The browse trend is mixed. Trend for one of the key species, mountain mahogany, is slightly down due to a slight decrease in population density. Trend for the other key species, mountain big sagebrush, is up due to a 54% increase in the population, excellent reproductive potential and a slight decrease in percent decadency. Overall, browse trend is up. Trend for the herbaceous understory is also up due to a dramatic increase in the quadrat frequency of grasses and forbs.

TREND ASSESSMENT
soil - up (5)
browse - up (5)
herbaceous understory - up (5)

1995 TREND ASSESSMENT

The soil trend is stable. The browse trend is mixed. Trend for mountain big sagebrush is slightly down, but it only contributes 20% of the total browse cover. The density of mature plants is stable, yet 32% of the decadent plants were classified as dying. This condition appears to be caused by heavy use, as 41% of the mature and decadent plants display heavy hedging (>60% of twigs browsed). Continued heavy use combined with prolonged drought will cause a downward trend in sagebrush. Another downward indicator for the population is the ratio of dead to live plants which is quite high at 1:9. True mountain mahogany shows a slightly upward trend. Population density increased, but much of this difference would mostly be due to the greatly increased sample size used in 1995. Vigor is generally good and percent decadence is low at 2%. Heavy use has continually increased since 1982. Currently, 35% of the population displays heavy hedging. However, this is not excessive. According to Shepherd (1971), shrubs from the Rosaceae family like serviceberry, bitterbrush, and mountain mahogany, can withstand heavy use for many years without causing reduced vigor. Overall, trend for browse is stable. The herbaceous understory trend is stable. Sum of nested frequency for grasses declined slightly while frequency of perennial forbs increased slightly. Nested frequency of alpine fescue which accounts for 45% of the grass cover increased significantly. Other dominant grasses are thickspike wheatgrass and Sandberg bluegrass which declined significantly in nested frequency.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - stable (3)

2000 TREND ASSESSMENT

Trend for soil is fairly stable. Percent cover of bare ground increased slightly, while litter cover declined. However, vegetative cover increased and perennial grass cover increased three-fold from 6% to 19%. Erosion is minimal due to the abundant and well dispersed protective ground cover combined with the gentle terrain. Trend for the key browse species, true mountain mahogany, is down slightly. Use is similar to 1995 estimates, but density has declined, percent decadence has increased from 2% to 23% and half of the decadent plants sampled appear to be dying. However, this only accounts for about 120 plants/acre. Few seedlings were encountered

and no young plants were sampled. The very dry conditions of this season are mostly responsible for the trend on mahogany. A return to normal precipitation patterns will reverse this trend on this long lived shrub. Mountain big sagebrush, the other key browse on the site, displays many of the same trends as mahogany. Use is actually more moderate compared to 1995, but percent decadence has doubled and 46% of the decadent sagebrush were classified as dying. No seedlings were encountered and recruitment from young plants is poor. Trend for the herbaceous understory is up slightly. Sum of nested frequency of perennial grasses increased slightly and cover increased three-fold. The dominant grass, sheep fescue, increased significantly in nested frequency. Nested frequency of perennial forbs remained fairly stable.

TREND ASSESSMENT
soil - stable (3)
browse - down slightly (2)
herbaceous understory - up slightly (4)

HERBACEOUS TRENDS --
Herd unit 08B, Study no: 6

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
G	Agropyron dasystachyum	$_{b}$153	$_{a}$114	$_{b}$162	20	64	51	61	.79	2.04
G	Bouteloua gracilis	-	-	3	-	-	-	1	-	.15
G	Carex spp.	42	31	23	6	19	14	9	.45	.26
G	Festuca ovina	$_{a}$62	$_{b}$118	$_{c}$226	36	27	54	76	2.84	10.77
G	Koeleria cristata	$_{b}$28	$_{ab}$26	$_{a}$13	25	14	10	5	.12	.10
G	Oryzopsis hymenoides	$_{a}$-	$_{b}$5	$_{a}$-	2	-	3	-	.21	-
G	Poa secunda	$_{b}$221	$_{a}$132	$_{a}$120	50	85	55	39	1.36	5.42
G	Sitanion hystrix	$_{a}$-	$_{a}$-	$_{b}$6	-	-	-	3	-	.06
G	Stipa comata	$_{a}$28	$_{b}$57	$_{a}$23	19	15	25	9	.52	.39
Total for Annual Grasses		0	0	0	0	0	0	0	0	0
Total for Perennial Grasses		534	483	576	158	224	212	203	6.31	19.22
Total for Grasses		534	483	576	158	224	212	203	6.31	19.22
F	Agoseris glauca	-	-	2	-	-	-	1	-	.00
F	Allium spp.	70	78	64	36	30	32	29	.36	.57
F	Antennaria rosea	$_{b}$15	$_{a}$3	$_{a}$6	10	8	2	2	.03	.06
F	Androsace septentrionalis (a)	-	1	-	-	-	1	-	.00	-
F	Arabis spp.	$_{b}$35	$_{a}$6	$_{a}$3	1	18	3	2	.01	.01
F	Aster spp.	$_{c}$72	$_{a}$-	$_{b}$10	4	32	-	4	-	.09
F	Balsamorhiza sagittata	3	-	-	-	1	-	-	-	-
F	Calochortus nuttallii	$_{a}$-	$_{b}$13	$_{a}$-	3	-	6	-	.03	-
F	Chenopodium fremontii (a)	-	$_{b}$8	$_{a}$-	-	-	3	-	.04	-
F	Collomia linearis (a)	-	$_{b}$74	$_{a}$-	-	-	30	-	.43	-
F	Comandra pallida	$_{a}$19	$_{ab}$30	$_{b}$55	5	10	17	25	.19	.45
F	Collinsia parviflora (a)	-	$_{b}$143	$_{a}$20	-	-	52	10	.91	.05
F	Cryptantha spp.	22	13	30	20	11	5	13	.33	.55

Type	Species	Nested Frequency			Quadrat Frequency				Average Cover %	
		'88	'95	'00	'82	'88	'95	'00	'95	'00
F	Delphinium nuttallianum	-	4	-	-	-	2	-	.01	-
F	Descurainia pinnata (a)	-	$_{b}$12	$_{a}$-	-	-	4	-	.04	-
F	Draba spp. (a)	-	$_{a}$87	$_{b}$104	-	-	34	49	.59	1.08
F	Erigeron eatonii	$_{b}$43	$_{b}$43	$_{a}$5	22	21	19	3	.92	.09
F	Erigeron speciosus	$_{a}$-	$_{b}$13	$_{c}$56	-	-	5	23	.22	1.09
F	Eriogonum umbellatum	$_{a}$24	$_{ab}$47	$_{b}$57	10	11	20	25	1.33	1.27
F	Gilia aggregata	-	-	-	4	-	-	-	-	
F	Heterotheca villosa	17	14	26	3	9	7	11	.23	.78
F	Hymenoxys acaulis	19	37	21	19	9	17	10	.23	.29
F	Ipomopsis aggregata	$_{a}$-	$_{a}$-	$_{b}$11	-	-	-	5	-	.05
F	Lepidium spp. (a)	-	2	-	-	-	2	-	.01	-
F	Lithospermum ruderale	-	-	2	2	-	-	1	.00	.03
F	Lupinus argenteus	-	2	1	-	-	1	1	.00	.01
F	Machaeranthera canescens	$_{b}$6	$_{a}$-	$_{b}$6	3	3	-	4	.00	.02
F	Microsteris gracilis (a)	-	$_{b}$96	$_{a}$5	-	-	44	3	.53	.01
F	Phacelia sericea	$_{a}$6	$_{b}$34	$_{a}$1	5	5	16	1	.08	.03
F	Polygonum douglasii (a)	-	$_{b}$45	$_{a}$8	-	-	21	3	.10	.01
F	Sedum lanceolatum	$_{a}$50	$_{b}$103	$_{b}$85	37	26	40	43	.79	.68
F	Senecio multilobatus	1	6	3	-	1	3	2	.04	.01
F	Taraxacum officinale	-	3	-	-	-	2	-	.01	-
F	Townsendia incana	1	-	-	-	1	-	-	-	-
F	Unknown forb-perennial	-	3	-	47	-	1	-	.03	-
F	Zigadenus paniculatus	-	-	3	-	-	-	1	-	.03
Total for Annual Forbs		0	468	137	0	0	191	65	2.67	1.16
Total for Perennial Forbs		403	452	447	231	196	198	206	4.90	6.14
Total for Forbs		403	920	584	231	196	389	271	7.58	7.31

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 08B, Study no: 6

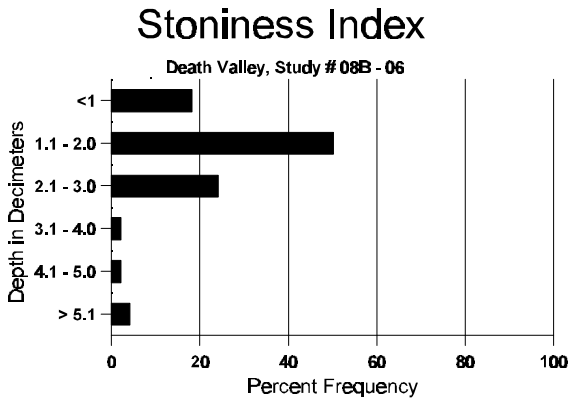
Type	Species	Strip Frequency '95	Strip Frequency '00	Average Cover % '95	Average Cover % '00
B	Amelanchier alnifolia	4	1	.91	.21
B	Artemisia frigida	0	2	-	-
B	Artemisia nova	3	0	-	-
B	Artemisia tridentata vaseyana	63	61	5.65	6.80
B	Cercocarpus montanus	61	43	16.22	12.24
B	Chrysothamnus viscidiflorus viscidiflorus	44	48	1.65	1.72
B	Gutierrezia sarothrae	0	2	-	-
B	Juniperus osteosperma	0	1	-	-
B	Mahonia repens	9	9	.69	.19
B	Opuntia spp.	22	23	.57	.24
B	Pediocactus simpsonii	3	8	-	.33
B	Purshia tridentata	4	3	1.38	.30
B	Symphoricarpos oreophilus	2	0	.21	-
B	Tetradymia canescens	6	10	.30	.18
Total for Browse		221	211	27.61	22.24

BASIC COVER --
Herd unit 08B, Study no: 6

Cover Type	Nested Frequency '95	Nested Frequency '00	Average Cover % '82	Average Cover % '88	Average Cover % '95	Average Cover % '00
Vegetation	354	361	7.00	12.00	35.36	48.55
Rock	63	62	4.00	5.25	2.33	3.81
Pavement	27	57	0	.25	.47	.39
Litter	396	381	59.25	58.75	60.37	53.99
Cryptogams	118	151	1.00	9.50	2.96	5.01
Bare Ground	221	241	28.75	14.25	18.35	20.98

SOIL ANALYSIS DATA --
Herd Unit 8B, Study # 6, Study Name: Death Valley

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.97	66.8 (11.26)	6.9	85.4	5.7	8.9	1.5	2.45	76.8	0.7



PELLET GROUP FREQUENCY --
Herd unit 08B, Study no: 6

Type	Quadrat Frequency		Pellet Transect	
	'95	'00	Pellet Groups per Acre '00	Days Use per Acre (ha) '00
Rabbit	12	26	435	N/A
Moose	-	1	9	0.5 (1)
Elk	17	19	618	48 (117)
Deer	37	14	757	58 (144)

BROWSE CHARACTERISTICS --
Herd unit 08B, Study no: 6

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	1	1	-	-	2	-	-	-	-	4	-	-	-	80	64	69	4
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20	49	58	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	75%	00%	00%	-75%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	80		-
	'00	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia frigida																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	4	-	-	-	-	-	-	-	-	4	-	-	-	266	4	5	4
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	7	0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40	4	4	2
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	332		-
	'95	0		-
	'00	40		-

Artemisia nova																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	1	-	1	-	-	-	-	2	-	-	-	40	11	20	2
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	33%	67%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	0%
	'88	0		0%
	'95	60		33%
	'00	0		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	88	10	5	-	-	-	-	1	-	-	16	-	-	-	1066			16
	95	5	2	1	1	-	-	-	-	-	9	-	-	-	180			9
	00	5	1	-	-	-	-	-	-	-	6	-	-	-	120			6
M	82	6	6	-	-	-	-	-	-	-	12	-	-	-	800	14	25	12
	88	9	10	3	-	-	-	-	-	-	22	-	-	-	1466	11	15	22
	95	25	16	34	3	1	-	-	-	-	79	-	-	-	1580	14	26	79
	00	30	21	3	4	4	2	-	-	-	63	-	1	-	1280	16	28	64
D	82	-	7	-	-	-	-	-	-	-	6	-	1	-	466			7
	88	5	8	1	-	-	-	-	-	-	14	-	-	-	933			14
	95	6	5	6	2	-	-	-	-	-	13	-	-	6	380			19
	00	13	21	1	3	2	-	1	-	-	21	-	1	19	820			41
X	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	240			12
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	520			26

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	54%	00%	04%	+54%
'88	44%	08%	00%	-38%
'95	22%	38%	06%	+ 4%
'00	44%	05%	19%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:
'82	1599		29%
'88	3465		27%
'95	2140		18%
'00	2220		37%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	95	2	2	1	2	-	-	-	-	-	7	-	-	-	140			7
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	10	4	-	-	-	-	-	-	-	14	-	-	-	933	34	8	14
	88	-	4	1	-	-	-	-	-	-	5	-	-	-	333	36	44	5
	95	1	3	9	1	43	18	-	-	-	75	-	-	-	1500	34	51	75
	00	2	13	-	3	14	8	1	-	-	41	-	-	-	820	38	62	41
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	1	1	-	-	-	1	-	-	1	40			2
	00	4	2	-	1	2	2	-	-	1	6	-	-	6	240			12

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	29%	00%	00%	-43%
'88	50%	13%	00%	+68%
'95	58%	35%	01%	-37%
'00	58%	21%	11%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	933	Dec:		0%
'88	533			0%
'95	1680			2%
'00	1060			23%

Chrysothamnus viscidiflorus viscidiflorus																		
Y	82	6	-	-	-	-	-	-	-	-	6	-	-	-	400			6
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	82	14	-	-	-	-	-	-	-	-	14	-	-	-	933	7	8	14
	88	21	-	-	-	-	-	-	-	-	18	-	3	-	1400	10	11	21
	95	70	1	-	3	-	-	-	-	-	74	-	-	-	1480	10	15	74
	00	77	-	1	9	-	-	3	-	-	74	-	16	-	1800	9	11	90
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	4	1	-	2	-	-	-	-	-	6	-	-	1	140			7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+29%
'88	00%	00%	11%	-19%
'95	01%	00%	00%	+25%
'00	.98%	.98%	17%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	1333	Dec:	0%
'88	1866		7%
'95	1520		0%
'00	2040		7%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	7	-	-	-	-	-	-	-	-	7	-	-	-	466	7	7	7
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0	5	4	0
	00	1	-	-	-	-	-	-	-	-	-	-	1	-	20	-	-	1
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	100%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	0%
	'88	599		22%
	'95	0		0%
	'00	40		50%

Juniperus osteosperma																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	1	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	0		-
	'00	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Mahonia repens																		
S	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	12	-	-	-	-	-	-	-	-	12	-	-	-	800			12
	88	25	-	-	-	-	-	-	-	-	25	-	-	-	1666			25
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
M	82	20	-	-	-	-	-	-	-	-	20	-	-	-	1333	7	2	20
	88	6	-	-	-	-	-	-	-	-	6	-	-	-	400	2	2	6
	95	29	-	-	31	-	-	8	-	-	68	-	-	-	1360	3	6	68
	00	42	-	-	9	-	-	-	-	-	51	-	-	-	1020	3	6	51

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	- 3%
'88	00%	00%	00%	-34%
'95	00%	00%	00%	-12%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	2133	Dec:	-
	'88	2066		-
	'95	1360		-
	'00	1200		-

Opuntia spp.																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	82	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	11	-	-	4	-	-	-	-	-	15	-	-	-	300			15
M	82	7	-	-	-	-	-	-	-	-	7	-	-	-	466	2	7	7
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333	3	9	5
	95	56	-	-	1	-	-	-	-	-	57	-	-	-	1140	3	9	57
	00	42	-	-	3	1	-	-	-	-	46	-	-	-	920	2	7	46
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
	00	2	-	-	-	-	-	-	-	-	1	-	-	1	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+20%
'88	00%	00%	00%	+44%
'95	00%	00%	02%	+ 6%
'00	02%	00%	02%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	532	Dec:	0%
	'88	666		0%
	'95	1180		2%
	'00	1260		3%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pediocactus simpsonii																		
S	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	3	-	-	-	-	-	-	-	-	3	-	-	-	60	2	5	3
	00	6	-	-	2	-	-	-	-	-	7	-	1	-	160	5	9	8
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	1	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	00%	00%	00%	+67%
'00	00%	00%	22%	

Total Plants/Acre (excluding Dead & Seedlings)				
'82	0	Dec:		0%
'88	0			0%
'95	60			0%
'00	180			11%

Purshia tridentata																		
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	2	-	3	2	-	-	-	-	7	-	-	-	140	19	50	7
	00	1	-	-	1	1	-	-	-	-	3	-	-	-	60	16	41	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	
'88	00%	00%	00%	
'95	57%	00%	00%	-57%
'00	33%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'82	0	Dec:	-
'88	0		-
'95	140		-
'00	60		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Rosa woodsii																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	5	-	-	-	-	-	-	-	-	5	-	-	-	333			5
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	333		-
	'95	0		-
	'00	0		-

Symphoricarpos oreophilus																		
Y	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	95	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	88	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	95	-	-	-	1	-	-	-	-	-	1	-	-	-	20	15	25	1
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21	71	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'82	00%	00%	00%
'88	00%	00%	00%
'95	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	0	Dec:	-
	'88	0		-
	'95	40		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Tetradymia canescens																		
Y	82	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	88	8	2	-	-	-	-	-	-	-	10	-	-	-	666			10
	95	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	2	-	-	-	-	-	-	-	-	1	-	1	-	40			2
M	82	10	-	-	-	-	-	-	-	-	8	2	-	-	666	8	13	10
	88	3	1	-	-	-	-	1	-	-	5	-	-	-	333	9	10	5
	95	12	2	-	-	-	-	-	-	-	14	-	-	-	280	10	15	14
	00	8	-	-	1	-	-	-	-	-	3	-	6	-	180	9	14	9
D	82	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	88	8	-	-	-	-	-	-	-	-	8	-	-	-	533			8
	95	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	1	-	-	1	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'82	00%	00%	00%	+39%
'88	13%	00%	00%	-79%
'95	13%	00%	00%	-19%
'00	00%	00%	62%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'82	932	Dec:	0%
	'88	1532		35%
	'95	320		0%
	'00	260		15%